APPENDIX E: INTEGRATED TECHNICAL PLANNING DETAILS

E.1 Integrated Technical Planning

Planning provides the basis for effective action and the ability to anticipate and prepare for changes that inevitably affect program progress. Planning keeps all the elements of the organization moving in synchronization toward the same goal by establishing baseline expectations of future and current actions. By establishing these baselines, the organization is better equipped to adapt to the inevitable changes facing it.

In the Acquisition Management System (AMS), the Integrated Program Plan (IPP) details the minimum planning required to meet JRC 2b. The IPP includes both programmatic and system engineering (SE) planning elements. Additional SE planning ensures a more accurate costing of the program. Performance of these planned elements will significantly reduces the percentage of requirements found in Operational Test and Evaluation. This additional SE planning will either be included in the IPP or in a separate SE Management Plan (SEMP).

The NAS Modernization System Safety Management Plan (SSMP) governs system safety efforts conducted in the AMS. The SSMP requires each program to develop, as part of the IPP, an Integrated System Safety Program (ISSP) tailored to the program's safety needs.

E.2 Requirements Management Planning

This planning specifies the tasks, products, responsibilities, and schedule for managing requirements throughout product development. The planning begins in the early stages of Investment Analysis and SEMP development and is baselined at the JRC 2b and is updated as necessary at subsequent exit reviews.

The planning section details the total effort in managing requirements. The work includes identifying and capturing requirements (Paragraph 4.3.3.1), analyzing and decomposing requirements (Paragraph 4.3.3.2), and allocating requirements (Paragraph 4.3.3.3).

E.2.1 Inputs to Requirements Management Planning

The following inputs are normally required for the planning section:

- Internal and external requirements as defined in Paragraph 4.3.1
- Component-specific program guidelines
- Program-specific organizational constraints and assumptions to be used in the program
- Program-specific schedule constraints and events
- Top-level conceptual alternatives, functional analyses, design support alternatives, and initial system evaluations
- Technology availability or constraints
- Concepts of the product (e.g., operational, maintenance, support, logistics)

E.2.2 Requirements Management Planning Steps

Following are the steps in producing a planning section, which is normally coordinated and written by an SE group.

E.2.2.1 Step 1: Collect Inputs

All program organizations that develop and manage requirements are responsible for providing planning section inputs to the planning coordinator.

E.2.2.2 Step 2: Prepare Planning Section

The planning coordinator prepares the planning section. Although no standard format exists for developing the section, it is recommended that the section contain the key elements of tasks, deliverables, responsibilities, and schedule. Developing a standard format may be included in this step. The section provides for deviations from the Requirements Management process (Section 4.3).

E.2.2.3 Step 3: Coordinate and Baseline

The planning coordinator provides drafts of the planning section to all stakeholders for review, and the version approved at the JRC b becomes the baseline planning section.

E.2.2.4 Step 4: Maintain Planning section

The planning coordinator monitors the program's progress continually throughout the life of the program, and any program changes in the program are reflected in the planning section.

E.2.2.5 Step 5: Provide Current Planning Section

The planning coordinator provides the planning section to all stakeholders (including, at a minimum, the program manager, users, and project leaders) required to manage by the planning section.

E.2.3 Outputs of Requirements Management Planning

The following outputs are normally required for the planning section.

E.2.3.1 Requirements Management Planning Tasks

It is recommended that the tasks to be described in the planning section reflect the processes detailed in Requirements Management (Section 4.3).

The other two subprocesses in the Requirements Management Process—Develop Verification Approach and Analyze Verification Data—are the subjects of the Verification process in Section 4.12.

E.2.3.2 Requirements Management Planning Products

A key function of the planning section is to define the products of the Requirements Management process. Another key function of the planning section is to assign responsibilities to various subprocesses within the Requirements Management process (Section 4.3).

E.2.3.3 Requirements Management Planning Schedule

A function of the planning section is to provide a schedule of the requirements management tasks. See Section 4.3 for a description of the schedule considerations.

E.2.4 Requirements Management Planning Metrics

The primary planning metric is the publication and approval of the planning section prior to JRC 2b and the updating at subsequent reviews. Another metric of the requirements process is the number of requirements identified after SDR. This metric may also apply to the planning section as well, since it reflects the quality of the program planning.

E.2.5 Requirements Management Planning Tools

A word-processing tool and DOORS (Dynamic Object-Oriented Requirements System) are needed.

A sample outline for a requirements management planning section appears in Table E-1. Also it is recommended that, the planning section be developed in accordance with the Requirements Management process described in Section 4.3 and reflect the principles reflected in government and industry standards, such as MIL-STD-961 or -490 for specifications, EIA 632 for the SE process, and ARP 4754 for commercial aircraft development. The outline (Table E-1) depicts the recommended contents of the Requirements Management planning section.

Table E-1. Table of Contents Requirements Management Section of SEMP

Requirements Management Planning Section Example Outline		
1	SCOPE	
1.1	Overview	
1.2	Process Overview	This section contains a diagram showing the interrelationship between the various process elements, including the requirements management tool, if any.
2	APPLICABLE DOCUMENTS	
3	TASKS	The tasks described are tied to the specific organizational and program requirements in accordance with Section 4.3.
3.1	Identify and Capture Requirements	
3.2	Analyze and Decompose Requirements	
3.3	Allocate Requirements	
3.4	Derive Requirements	
3.5	Manage Requirements Changes	
4	PRODUCTS	This section describes the various program requirements

Requirements Management Planning Section Example Outline		
		documents. The section describes what organizational entity is the recipient of the product; for example, the product team, stakeholder, other project teams, company management, or outside organizations, such as manufacturing, product support, test and evaluation, or supplier management.
4.1	Requirements Documents	This section enumerates and describes the various program requirements documents to be produced.
4.2	Requirements Allocation Matrices	This section describes the characteristics of the requirements allocation sheets (RASs) to be produced on this program.
5	RESPONSIBILITIES	This section details responsibilities of the various organizational entities to accomplish the tasks of Section 3 above. The responsibilities are to be tied to the tasks of Section 3.
6	SCHEDULE	The schedule shown in this section is to be tied to the milestones of the IPP.
7	AUTOMATED REQUIREMENTS TOOL	This section describes the planned use of the requirements management tool, if any.
8	NOTES	
	APPENDICES	

E.3 Functional Analysis Planning

The Functional Analysis planning section of the SEMP specifies the tasks, products, responsibilities, and schedule for functional analysis throughout the development of the product. Because there is no program level SEMP in the early phases of the program (i.e., phase 1 of Investment Analysis), Functional Analysis in these phases is guided by the NAS-level SEMP. When the IPP is developed, the Functional Analyses is guided by the program's tailored SEMP. The planning section is baselined at the JRC-2B and is updated as necessary at subsequent exit reviews. This planning section details the total effort for managing functional analysis. This work includes analysis of the concept of operations and environment, the decomposition of functions into sub-functions, decomposing and allocating requirements to functions, evaluating alternative decompositions, defining functional sequences and timelines, defining functional interfaces, and documenting the functional baseline. The outline (Table E-2) depicts the recommended contents of the Functional Analysis planning section.

E.3.1. Inputs to Functional Analysis Planning

The following inputs are normally required for planning:

- Mission Need Statement (MNS) and final Requirements Document (fRD), which detail the system's expected operational environments
- Component-specific program guidelines

- Program-specific constraints and assumptions, such as nature of the program's project teams
- Program-specific schedule constraints and events
- NAS SEMP, which provides the overall plan for conducting SE as part of NAS modernization

E.3.2 Functional Analysis Planning Steps

The planning section is normally coordinated and written by an SE group. Following are the steps in producing this section.

E.3.2.1 Step 1: Collect Inputs

All program organizations developing and managing requirements shall provide planning inputs to the planning coordinator.

E.3.2.2 Step 2: Prepare Planning Section

The planning coordinator prepares the planning section. No standard format exists for developing the section; however, it is recommended that the section contain the key elements of tasks, deliverables, responsibilities, and schedule. The plan provides for justification and deviations from the Functional Analysis process (Section 4.4).

E.3.2.3 Step 3: Coordinate and Baseline

Develop draft plan and coordinate with stakeholders for review. The version approved at JRC-2b becomes the baseline plan.

E.3.2.4 Step 4: Maintain Planning Section

The plan coordinator maintains continuous cognizance of the program progress throughout the life of the program, and changes in the program are reflected in the planning section.

E.3.2.5 Step 5: Provide Current Planning Section

The plan coordinator provides the planning section to all parties required to manage this section. At a minimum, these organizations include the program manager, the stakeholders, and project leaders.

E.3.3 Outputs of Functional Analysis Planning

The following outputs are normally required for the planning section.

E.3.3.1 Functional Analysis Planning Tasks

It is recommended that the tasks described in the planning section reflect the processes described in Functional Analysis (Section 4.4). These processes are as follows.

E.3.3.2 Functional Analysis Planning

The tasks necessary to develop each of the products of functional analysis must be planned for. These tasks include:

- Definition of the operational mission, environment, and requirements
- Development of the Concept of Operations (Use)
- Definition of top-level functions and decomposition to the lowest level
- Definition of internal and external interfaces
- Evaluation of alternative decompositions
- Development of sequences and timelines
- Development of functional architecture

E.3.3.3 Functional Analysis Planning Responsibilities

A key function of the planning is to assign responsibilities to various subprocesses within the Functional Analysis process. Assign a senior SE to lead the functional analysis and ensure that each task/subprocess (listed above) is also assigned. These assignments may vary greatly according to the product and the organization.

E.3.3.4 Functional Analysis Planning Schedule

The planning function shall provide a schedule of the functional analysis tasks. It is recommended that the schedule show the delivery dates of each product. The schedule shall present the sequence of events along with task start dates and end dates and key them to the events outlined in the IPP template of Figure 4.2-3.

E.3.3.5 Functional Analysis Planning Tools

No templates or standards currently exist for this planning. However, the planning section is developed in accordance with the Functional Analysis process (Section 4.4).

Table E-2. Table of Contents Functional Analysis Planning Section of SEMP

Functional Analysis Planning Section Example Outline		
1	SCOPE	
1.1	Overview	
1.2	Process Overview	This section contains a diagram showing the interrelationship between the various process elements, including tools, if any.
2	APPLICABLE DOCUMENTS	
3	TASKS	The tasks described are tied to the specific organizational and program requirements in accordance with Section 4.4.
4	PRODUCTS	This section describes the various functional analysis outputs in accordance with Paragraph 3.1.3.2. The section describes what organizational entity is the recipient of the product; for example, the product team, stakeholder, other project teams, company management, or outside organizations, such as manufacturing, product support, test and evaluation, or supplier management.

Functional Analysis Planning Section Example Outline		
5	RESPONSIBILITIES	This section details responsibilities of the various organizational entities to accomplish the tasks of Section 3. The responsibilities are to be tied to the tasks of Section 3.
6	SCHEDULE	The schedule shown in this section is to be tied to the milestones of the IPP.
7	AUTOMATED REQUIREMENTS TOOL	This section describes the planned use of the requirements management tool, if any.
8	NOTES	
	APPENDICES	

E.4 Synthesis Planning

Synthesis planning includes all of the activities need to transform the needs into alternative solutions balanced to meet and provide needed capabilities while adhering to programmatic, operational, environmental, and technical constraints.. It includes the resources for all activities in Section 4.1.3.2 below:

The outline (Table E-3) depicts the recommended contents of the Synthesis planning section.

E.4.1 Inputs to Synthesis Planning

The following inputs are normally required for planning:

- MNS and fRD, which detail the system's expected operational environments
- Component-specific program guidelines
- Program-specific constraints and assumptions, such as nature of the program's project teams
- Program-specific schedule constraints and events
- NAS SEMP, which provides the overall plan for conducting SE as part of NAS modernization

E.4.2 Synthesis Planning Steps

The planning section is normally coordinated and written by an SE group. Following are the steps in producing this section.

E.4. 2.1 Step 1: Collect Inputs

All program organizations developing and managing requirements shall provide planning inputs.

E.4.2.2 Step 2: Prepare Planning Section

Prepare the planning section, including all resources required to perform the key elements of tasks, deliverables, responsibilities, and schedule. The plan provides for justification and deviations from the Synthesis process (Section 4.5).

E.4.2.3 Step 3: Coordinate and Baseline

Develop draft plan and coordinate with stakeholders. The version approved at JRC 2b becomes the baseline plan.

E.4.2.4 Step 4: Maintain Planning Section

Maintain continuous cognizance of the program progress throughout the life of the program, and changes in the program are reflected in the planning section.

E.4.2.5 Step 5: Provide Current Planning Section

Provide the planning section to all parties required to manage this section. At a minimum, these organizations include the program manager, the stakeholders, and project leaders.

E.4.3 Outputs of Synthesis Planning

The following outputs are normally required for the planning section.

E.4.3.1 Synthesis Planning Tasks

It is recommended the tasks described in the planning section reflect the processes described in Synthesis (Section 4.5). These processes are as follows:

E.4.3.2 Synthesis Planning

The tasks necessary to develop each of the products of Synthesis must be planned for. These tasks include:

- Review requirements baseline and Functional Architecture:
- Design Solution set:
- Identify Alternatives for the Design Solution Set:
  - Perform Trade Study Requests
  - Initiate Requirements feedback loop
  - Initiate Design feedback loop
- Allocate requirements to System Elements
- Define Design and Performance Characteristics
- Define Physical Architecture
- Design Alternative Analysis and Refinement
- Check Requirements Compliance
- Select Preferred Design Solution

E.4.3.3 Synthesis Planning Responsibilities

A key function of the planning is to assign responsibilities to various tasks within the Synthesis process. Ensure that each task (listed above) is assigned. These assignments may vary greatly according to the product and the organization.

E.4.3.4 Synthesis Planning Schedule

The planning function shall provide a schedule of the Synthesis tasks. It is recommended that the schedule show the delivery dates of each product. The schedule shall present the sequence of events along with task start dates and end dates and key them to the events outlined in the IPP template of Table 4.2-2 in Section 4.2, Integrated Technical Planning.

E.4.3.5 Synthesis Planning Tools

No templates or standards currently exist for this planning. However, the planning section is developed in accordance with the Synthesis process (Section 4.5).

Table E-3. Table of Contents Synthesis Planning Section of SEMP

Synthesis Planning Section Example Outline		
1	SCOPE	
1.1	Overview	
1.2	Process Overview	This section contains a diagram showing the interrelationship between the various process elements, including tools, if any.
2	APPLICABLE DOCUMENTS	
3	TASKS	The tasks described are tied to the specific organizational and program requirements in accordance with Section 4.5.
4	PRODUCTS	This section describes the various Synthesis outputs in accordance with Section 4.5. The section describes what SE element is the recipient of the product.
5	RESPONSIBILITIES	This section details responsibilities of the various organizational entities to accomplish the tasks of Section 3. The responsibilities are to be tied to the tasks of Section 4.5.
6	SCHEDULE	The schedule shown in this section is to be tied to the milestones of the IPP.
7	AUTOMATED REQUIREMENTS TOOL	This section describes the planned use of the requirements management tool, if any.
8	NOTES	
	APPENDICES	

E.5 Trade Studies Planning

The Trade Studies planning shall document the formal management planning regarding how alternative solutions to a problem or design issue associated with a program/project product development is to be assessed in a fair and impartial manner.

Trade Studies planning shall include the following:

- Formats for how trade study results and information are to be presented to management at design reviews
- Identification of the organization or person designated to be the trade study leader
- Identification of any tools that are to be used in performing of the trade study (i.e., cost models, computer simulations, test articles and fixtures, analytical tools)
- Criteria (including constraints) under which the trade study is to be conducted
- Instructions on where trade study results and data are to be stored for future reference and which organization is responsible for maintaining the data
- Identification of resources

The outline (Table E-4) depicts the recommended contents of the Trade Studies planning section.

E.5.1 Inputs to Trade Studies Planning

Evaluate at a minimum the following inputs before preparing the Trade Study planning section.

- Definition of the problem to be studied
- Program/project schedule
- Program/project requirements
- Document preparation tools

E.5.2 Trade Studies Planning Steps

E.5.2.1 Step 1: Collect Inputs

Coordinate with the program technical groups to obtain input information, including source data.

E.5.2.2 Step 2: Analyze Inputs

Review and organize input data.

E.5.2.3 Step 3: Define Activities and Effort

Work with the technical experts to document trade study activities.

E.5.2.4 Step 4: Lay Out and Baseline Section

Develop and coordinate the draft planning section of the SEMP, obtain necessary approvals (program management, senior technical experts, etc.), and release the baseline version.

E.5.2.5 Step 5: Interface With Other Processes

Coordinate and interface with other processes throughout planning.

E.5.3 Outputs of Trade Studies Planning

The output is a Trade Studies planning section of the SEMP that includes all tasks required to successfully complete trade studies.

E.5.3.1 Trade Studies Tools

It is recommended that tools compatible with the problem under study be selected before the trade study is conducted.

E.5.3.2 Trade Studies Schedule

It is recommended that a schedule be developed that identifies personnel responsible and due dates for completing each task associated with the trade study. The schedule is designed to support the overall program/project integrated master schedule.

E.5.4 Trade Studies Planning Metrics

The metric for measuring the product of this process is completion of the planning section. Also, the cost to produce and update the section may be measured.

E.5.5 Trade Studies Planning Tools

A word processing tool is needed.

Table E-4 Table of Contents Trade Studies Planning Section of SEMP

Trade Studies Planning Section Example Outline		
1	SCOPE	
1.1	Overview	
1.2	Process Overview	This section contains a diagram showing the interrelationship between the various process elements, including tools, if any.
2	APPLICABLE DOCUMENTS	
3	TASKS	The tasks described are tied to the specific organizational and program requirements in accordance with Section 4.6.
4	PRODUCTS	This section describes …
5	RESPONSIBILITIES	This section details responsibilities of the various organizational entities to accomplish the tasks of …
6	SCHEDULE	The schedule shown in this section is to be tied to the milestones of the IPP.
7	AUTOMATED REQUIREMENTS TOOL	This section describes the planned use of tools.

Trade Studies Planning Section Example Outline		
8	NOTES	
	APPENDICES	

E.6 Interface Management Planning

The Interface Control planning section of the IPP documents the formal management system of interface controls that ensures physical and functional compatibility between interfacing hardware, software, and facilities. The plan provides the means for identifying and resolving interface incompatibilities and for determining the impact of interface design changes. This Interface Control planning guides the management, control, and documentation of all system functional and physical interfaces. The Interface Control planning section also contains interface requirements and templates for preparing, revising, and processing ICDs unique to the program. The Interface Control planning section addresses supplier participation in the interface process. (Integrated Technical Planning (Section 4.2) provides detailed instructions on this topic.)

This planning:

- Provides the means for identifying, defining, documenting, and controlling the interfaces at all levels of the system
- Provides the means for changing the interfaces as required by the evolution of the design and for resolving interface incompatibilities
- Guides management, control, and documentation of all system functional and physical interfaces
- Establishes the Interface Working Group (IWG) and its policies and procedures
- Contains requirements and templates for preparing, revising, and processing the interface documentation; identifies products
- Establishes the participants of the I/F management process and their responsibilities
- Establishes the interface management schedule

The IWG Chair drafts the IM planning policies and procedures in the early phase of Investment Analysis concurrent with the IPP Schedule. The IWG Chair updates and reviews the IM planning section of the SEMP to reflect the system functional and physical architectures developed in later phase of Investment Analysis.

E.6.1 Inputs to Interface Management Planning

There are several inputs typically required to prepare the interface management planning section. A description of each input follows along with a short justification and the sources of the input. Other unique program inputs may exist that are relevant to preparing the IM planning section. As appropriate, it is recommended that these be included:

IPP. The IPP is required to enable preparation of the I/F management schedule and to ensure coherent, complete, consistent, and timely I/F design at all levels of the system.

SEMP. The IM planning section depends on products defined and scheduled by the SEMP.

System Requirements Documents. The documents define the system external interfaces and the (internal) interfaces between the system segments.

System Functional and Physical Architecture. These architectures determine where the system/segment interfaces exist and are the point of departure for the detailed identification and definition of the interfaces.

Design Review Plans. These plans are used as the bases for conducting reviews and audits of the interfaces.

E.6.2 Interface Management Planning Steps

Following are the major steps to develop IM planning.

E.6.2.1 Step 1: Appoint IWG Chair

The program management generally appoints the IWG Chair, who is the key person in the I/F definition and control process. This individual is identified early in the program because he/she is chartered with the responsibility of developing and establishing the policies and process for identifying, defining, documenting, auditing, and controlling interfaces.

E.6.2.2 Step 2: Collect Inputs

Collect the inputs identified in Paragraph E.6.1.

E.6.2.3 Step 3: Analyze Inputs

Review, analyze, and organize the inputs collected. The interfaces and constraints embedded in the requirement documents and the system architectures are to be evaluated and assimilated and used as bases for establishing interfaces and responsibilities, as well as to determine if there are program-peculiar interfaces that need special treatment/attention. The planning sections and schedules are to be used as bases for constructing the interface management schedule.

E.6.2.4 Step 4: Define Activities and Effort

Establish the IWG policies and procedures; delineate and coordinate the processes to be applied for identifying, defining, documenting, changing, auditing, and controlling interfaces; identify the responsibilities of participants; and identify standard formats to be used for documenting interfaces and their change process.

E.6.2.5 Step 5: Lay Out and Baseline

Prepare the IM planning section, which captures the processes, formats, schedule, and responsibilities. The processes and formats embedded in the IM planning section of the SEMP shall be consistent with the IPP. Using the IPP and IPS, and the SEMP and SE Schedule as bases, prepare an interface management schedule. The schedule may include all significant control and audit milestones defined by the corporate design review processes.

E.6.2.6 Step 6: Interface With Other Processes

The IM planning section of the SEMP shall be coordinated with the IPP and SE schedule and the design review planning sections.

E.6.2.7 Step 7: Update/Maintain the Planning Section

The IWG Chair shall review the IM planning section of the SEMP at the beginning of each of the AMS phases to determine if adjustments to the processes and schedules are required to ease or ensure effective fulfillment of the objectives of that phase.

E.6.3 Outputs of Interface Management Planning

The principal output is an IM planning section of the SEMP delineating the I/F identification, definition, documentation, approval, change, and control and audit process. In addition, the IM planning section establishes the IWG and its policy and procedures, constituents, and constituents' responsibilities.

E.6.4 Interface Management Planning Metrics

The IM planning section is to be reviewed to ensure completeness and cohesiveness. The interface management schedule and products are to be reviewed for consistency with the rest of the SEMP and SE schedule.

E.6.5 Interface Management Planning Tools

A word-processing tool is needed.

To facilitate preparation of the IM planning section of the SEMP, refer to all applicable sections of the System Engineering Manual. The outline (Table E-5) depicts the recommended contents of the IM planning section.

Table E-5. Interface Management Planning Section Outline of SEMP

Interface Management Planning Section Outline	
1	SCOPE
1.1	Overview
1.2	System Overview
2	APPLICABLE DOCUMENTS
3	INTERFACE WORKING GROUP
3.1	IWG Policy and Procedures
3.2	IWG Membership and Responsibilities
3.2.1	IWG Chair
3.2.2	Interface Custodian
3.2.3	Interface Participant
4	INTERFACE CONTROL PROCESS
4.1	Establishing Interfaces
4.1.1	Identifying Interfaces
4.1.1.1	Scope Sheet
4.1.1.2	Documenting ICDs

Interface Management Planning Section Outline	
4.1.1.3	Coordinating Interfaces
4.1.1.4	Auditing, Statusing, and Controlling ICDs
4.1.1.4.1	Authorized ICD List
4.1.1.4.2	Review at SRR
4.1.1.4.3	Review at SDR
4.1.1.4.4	Review at Preliminary Design Review (PDR)
4.1.1.4.5	Review at CDR
4.1.1.4.6	Review at FCA/PCA
5	REVISING INTERFACES
5.1	Change Request Preparation
5.1.1	Review/Coordinate Change Request
5.1.2	Change Approval and Documentation
6	INTERFACE MANAGEMENT SCHEDULE
7	NOTES
Appendices	

E.7 Specialty Engineering Planning

All specialty planning sections will follow the format of Section E.7.1 below. The other specialty planning sections will include Human Factors, RMA, Quality Engineering, Electromagnetic Environmental Effects, Information System Security, and Hazardous Materials.

E.7.1 System Safety Management Planning

System safety is the application of engineering and management principles, criteria, and techniques to optimize safety within constraints of operational effectiveness, time, and cost throughout all program lifecycle stages. The SSMP governs system safety efforts conducted in the AMS. The SSMP requires each program to develop, as part of the IPP, an Integrated System Safety Program (ISSP) tailored to the program's safety needs. The ISSP calls for contractors or vendors to develop and maintain a SSPP that details the planned safety activities. The SSPP describes safety assessments, tasks, and activities of system safety management and system safety engineering required to support the design process and to identify, evaluate, and eliminate or control hazards throughout the system lifecycle.

Government System Safety engineers in the program are responsible for generating the ISSP, and, typically, the System Engineering Council (SEC) approves it as the first step in the system safety program. System safety is an integral element of system engineering applicable to all design stages. Consequently, the stakeholder typically requires the SSPP as early as possible in the program lifecycle, usually within 60 to 90 days after contract award. Updates to the SSPP are necessary from stage to stage. Significant program changes may also warrant an update.

A comprehensive, approved SSPP provides value to the overall program. Misunderstandings are avoided regarding the safety definitions, scope of safety analysis, and risk-resolution procedures. The SSPP serves to increase safety awareness within the integrated team,

building system safety into the product. The SSPP is tailored guidance for the System Safety Manager or engineer. Finally, the SSPP serves as an important audit trail, justifying the safety work performed and the methodology for safety decisions made. The program shall use the format and content guidelines for the SSPP documented in the SSMP. The SSMP is available on the Web (http://fast.faa.gov/).

E.7.1.1 Inputs to System Safety Management Planning

Requirements for the System Safety effort detailed in the plan may come from stakeholders' requirements, which flows out of the Requirements Management Process (Section 4.3). Compliance shall be with the FAA NAS Modernization SSMP in the AMS FAA Acquisition System (FAST) Toolset.

Available system safety evaluation tools shall be used to determine, validate, and verify requirements in accordance with this manual and the SSMP.

Inputs typically come from the engineer implementing the SE process. These include, potentially, all design groups and, depending on the program structure, either other specialty engineering groups or SE representatives on design teams. Among others, ensure coordination with Human Factors, Reliability, Maintainability, Quality, and Test and Evaluation.

Lessons learned from previous programs, incidents, and accidents are to be included.

The program shall form a program-specific System Safety Working Group (SSWG) that works with the FAA's NAS Modernization SSWG in managing risk.

Programmatics are made available from the "Manage Program" process.

E.7.1.2 System Safety Management Planning Steps

E.7.1.2.1 Step 1: Collect Inputs

Coordinate with the program technical groups to obtain input information, including source data, tasks to be delineated in the plan, and other information.

E.7.1.2.2 Step 2: Analyze Inputs

Review and organize input data.

E.7.1.2.3 Step 3: Define Activities and Effort

Work with the technical experts to document as specifically as possible system safety assessment activities.

E.7.1.2.4 Step 4: Lay Out and Baseline Plan

Develop and coordinate the draft plan, incorporating revisions; obtain necessary approvals (lines of business, program management, senior technical experts, stakeholders); and release the baseline version of the plan.

E.7.1.2.5 Step 5: Interface With Other Processes

Coordinate and interface with other processes throughout plan deployment.

E.7.1.2.6 Step 6: Update/Maintain the Plan

Repeat this process to produce updates to the plan during the course of the program.

E.7.1.3 Outputs of System Safety Management Planning

The Output is the SSMP, which contains details on the intent, procedures, requirements, techniques, and criteria of the system safety program. The program shall use the format and content guidelines for the SSPP documented in the SSMP. The SSMP is available on the Web (http://fast.faa.gov/).

E.7.1.4 System Safety Management Planning Metrics

The metric for measuring the product of this process is completion of the plan in accordance with the SSMP. Additionally, the cost to produce and update the plan may be measured.

E.7.1.5 System Safety Management Planning Tools

Refer to the NAS Modernization SSMP (http://fast.faa.gov/).

E.7.2 Human Factors Engineering Planning

The Human Factors Engineering Human Factors Engineering (HFE) planning section of the SEMP will cover all aspects of HFE as detailed in System Engineering Manual (SEM) Section 4.8.3.

E.7.3 Quality Engineering Planning

The Quality Engineering (QE) planning section of the SEMP will cover all aspects of QE as detailed in SEM Section 4.8.5. This includes all the systematic activities implemented within the quality system that can be demonstrated to provide confidence that a product or service will fulfill requirements.

E.7.4 Reliability, Maintainability, and Availability Planning

The Reliability, Maintainability and Availability (RMA) planning section of the SEMP will cover all aspects of RMA as detailed in SEM Section 4.8.2.

E.7.5 Electromagnetic Environmental Effects Planning

The Electromagnetic Environmental Effects (E^3) planning section of the SEMP will cover all aspects of E^3 as detailed in SEM Section 4.8.4.

E.7.6 Hazardous Materials Management/Environmental Engineering Planning

The Hazardous Materials Management/Environmental Engineering (HMM/EE) planning section of the SEMP will cover all aspects of HMM/EE as detailed in SEM Section 4.8.7.

E.7.7 Information System Security Planning

The Information System Security (ISS) planning section of the SEMP will cover all aspects of ISS as detailed in SEM Section 4.8.6.

E.8 Integrity of Analyses Planning

E.8.1 Analysis Management Planning

The Analysis Management planning section of the SEMP is compiled following JRC 1 approval. It supports the objective of that process: "to create high likelihood that the program's analyses are credible, useful, and sufficient." Analysis Management planning defines the analyses to be performed throughout the program and the operational criteria for the analytic tools to be used, as well as the users and the requirements for verifying that the results are correct and sufficient. As a part of the SEMP, this section is reviewed with any other plans at the JRC 2b. The outline (Table E-6) depicts the recommended contents of the Integrity of Analysis planning section.

Table E-6. Table of Contents Analysis Management Planning Section of SEMP

Analysis Management Planning Section Example Outline		
1	SCOPE	
1.1	Overview	
1.2	Process Overview	This section contains a diagram showing the interrelationship between the various process elements, including tools, if any.
2	APPLICABLE DOCUMENTS	
3	TASKS	The tasks described are tied to the specific organizational and program requirements in accordance with Section 4.9.
4	PRODUCTS	This section describes the various …
5	RESPONSIBILITIES	This section details responsibilities of the various organizational entities to accomplish the tasks of Section …
6	SCHEDULE	The schedule shown in this section is to be tied to the milestones of the IPP.
7	AUTOMATED REQUIREMENTS TOOL	This section describes the planned use of the requirements management tool, if any.
8	NOTES	
	APPENDICES	

E.8.1.1 Inputs to Analysis Management Planning

To prepare Analysis Management planning, the program team members with a need to perform or to have performed one or more analyses shall provide inputs. Often in this phase of planning a program, there is an iteration in which initial requests to have each analysis authorized and funded are seen as too extensive and costly for the program. Occasionally, program management determines that other analyses be performed or that analyses may replace tests or improve confidence; however, history shows that usually more analyses are initially requested than are approved. Negotiations then take place between the proponents of the analyses and program management until a balanced set of analyses are defined. These negotiations may involve such compromises as reducing the scope of simulations and analyses—and possibly relaxing the precision, which the analyst may wish—to a level that management believes is adequate. Ultimately, each analysis earns its way into the integrated program plan by improving the management-balanced program metrics of cost, performance, and time/schedule. For a more in-depth treatment, see Integrity of Analyses (Section 4.9).

This input will include the following:

- Title and brief description of the analysis
- Description of programmatic benefit to be gained from the successful performance of the analysis; (i.e., the role the analysis plays in the program)
- Relative place in the project schedule:
  - Precursor tasks and dependencies
  - Successor tasks that directly depend upon the analysis (i.e., the interfaces of the analysis to the program)
- Resources:
  - Estimate of duration and resources required; resources may include labor hours, charged computer runtime, lab support charges, and similar programmatic cost and schedule burdens
  - System requirements
  - Unique analysis technology (both as used in the system being analyzed and as used to perform or support a part of the analysis)
  - Data sets to be used in the analysis (e.g., configuration-controlled set of data (environmental factors (atmospheric models, extent of corrosion conditions, etc.)), trade study parameters (e.g., range penalty per pound of weight added), material properties, etc.)
  - Analytical tool(s) selected and basis/justification of selection
  - Process and plan for ensuring competence of the analyst (credentials, training, certification, testing, etc.)
  - Subtasks to be performed to begin, perform, and validate the analysis

E.8.1.2 Analysis Management Planning Steps

E.8.1.2.1 Step 1: Collect Inputs

Coordinate with program technical groups on analysis needed.

E.8.1.2.2 Step 2: Analyze Inputs

Review and organize the data; check for conflicts in precursor/successor relationships among different analyses; and prepare management summaries of resource needs (cost, equipment, facilities, and talent).

E.8.1.2.3 Step 3: Coordinate With Interfacing Program Functions

Determine details of configuration control of tool and skill inventories, data sets, scheduling, and so that specific and correct references may be made in the Analysis Management planning section.

E.8.1.2.4 Step 4: Lay Out and Baseline the Planning Section

Coordinate the draft planning section; support management/analyst/user negotiations; incorporate revisions; obtain necessary approvals; and release the baseline version of the planning section in the SEMP.

E.8.1.3 Outputs of Analysis Management Planning

The output of this process *is* the Analysis Management planning section of the SEMP, which typically consists of these elements:

Introduction. This section covers scope and purpose. It is recommended that this section include any analysis that involves separate task management and control, or which has stakeholders from the analyst's sub organization, or which is deemed to have a significant influence on the program product. On the other hand, minor analyses that merely fill in details of work within a single sub organization and are small in scope are not intended to be formally controlled by this planning section (although the precepts of the process "Integrity of Analyses" always apply as a best practice).

Specific comments on the role of Configuration Management (CM) as it applies to Analysis Management. It is recommended that approved analytic tools (including special or proprietary procedures, computer programs, networks, and workstations; and physical, computational, and hybrid models) be under CM, as well as rosters of analysts with expertise annotated. It is recommended that data sets especially be under CM, and the AMP requires use of configured data in managed analyses. (Several analyses using conflicting data leads to faulty conclusions that confuses a program.) Within the planning section, it is also recommended that some special notation (like **{CM}**) be appended to any reference of name, tool, or data that is configuration controlled.

- Abstract of the programmatic approach(es) to ensure the competence of the analysts. This may range from merely listing credentials within each analysis to a rigorous testing and validation program of analysts doing certain work. With the various options chosen by the program, the reference in any one of the analysis coverages will be simplified.

Tailoring. This section provides tailoring of specific documentation requirements, where applicable. Coordination with the procuring authorities is recommended so that agreement is reached on what tailoring needs to be done to minimize any delay in getting the planning approved.

Organization. This subsection discusses the organizational aspects of analysis management, which is typically a product of SE. The analyses may be performed in any sub organization or by contractors; if so, a separate contracting plan will supplement the Analysis Management planning section. When there is more than one stakeholder for an analysis, the analysis

coverage shall deal with possibly conflicting needs. Thus, a hierarchical ranking of precision, scope, timing, and quality of the analysis product will be established, and a single set of requirements levied on the analysis. Analysis Management planning development, deployment, and maintenance are the responsibility of SE within the program. The data to be presented (see the "Inputs to Software/Development Planning" (Paragraph 4.2.4.4.3.1)) for each analysis is the responsibility of an analyst assigned to that analysis. This responsibility covers acquisition, interpretation, analysis, and transmittal of the data to the Analysis Management planning section author.

Specific Analyses. This subsection covers each of the various analyses that qualify for inclusion in the Analysis Management planning. The format follows and addresses the items identified in Paragraph 4.2.4.4.3.1. The final subsection for each analysis will be the connectivity (precursor and successor tasks) of the analysis, and the duration and level of effort required.

E.8.1.4 Analysis Management Planning Metrics

The metrics for the process of preparing and maintaining the Analysis Management planning section of the SEMP are the completion of the planning, the readiness of the planning section to support management/analyst/stakeholder negotiations, and the costs of the first draft, release, and maintenance of the planning section.

E.8.1.5 Analysis Management Planning Tools

Analysis Management planning is typically prepared using a program-standard word processing tool. Interfacing tools may be noted, to include the business-control and scheduling tools, and the CM tools, as well as any program-unique tools identified.

E.9 Risk Management Planning

Risk is inherent in every program. Stakeholders know this and expect contractors to address risks in program plans. SE addresses three facets of risk: technical, schedule, and cost. Technical risks include all events that may prevent the program from satisfying contractual requirements, including performance, supportability, maintainability, and regulatory requirements. Schedule risks are events that may prevent timely execution of tasks identified in the IPP. Cost risks are events that may cause actual expenditures to exceed estimated costs.

Risk management is a key process within SE. The program and functional managers implement it by ensuring appropriate resources are applied to reduce risk to acceptable levels. Risk management consists of five essential components: identify risks, analyze risks, identify mitigation options, implement risk-reduction plan, and monitor risks.

The risk management planning section describes the approach, methods, procedures, and criteria for risk management and its integration into the program decision process. It is continually updated throughout the program life with the SEMP.

E.9.1 Inputs to Risk Management Planning

Inputs include program goals, constraints, IPP/IPS, Rough Order Magnitude/Basis of Estimate.

The risk management process is tailored according to the complexity and criticality of each specific project. The program manager weighs mission goals with the potential benefits and

costs and in determining the acceptable level of risk for a program. Stakeholders and regulatory directives may also affect determination of acceptable risk levels.

E.9.2 Risk Management Planning Steps

Risk Management planning guides the program and functional managers in ensuring that adequate risk management is applied at the key decision points of a program.

E.9.2.1 Step 1: Establish Risk Review Team

The team should include at least the project task leaders. It is recommended that all affected specialty support groups be identified and consulted throughout the risk management process. In addition, it is recommended that independent non-advocate experts and stakeholders, if appropriate, be identified for participation during formal risk reviews.

E.9.2.2 Step 2: Define Risk Management Process

It is recommended that the Risk Management process, or a specially tailored version that is followed by the program, be documented, as well as justification for modification of the process provided. It is further recommended that the process contain the key steps of identifying risk, assessing risk, and mitigating risk, as well as the procedure for implementing contingency plans and risk monitoring. It is also recommended that appropriate tools to implement each step be identified if available.

E.9.2.3 Step 3: Define Risk Assessment Criteria

The risk categories (technical, schedule, and cost) and risk levels defined in the Risk Management process may not be appropriate for every program. Technical risks may be subdivided into such categories as Performance, Supportability, and Software, to emphasize key requirements based on program goals. Acceptable schedule or cost risks may also require adjustment based on program goals or constraints. It is recommended that programmatic risks be added if appropriate; justifications for process modification documented; and criteria for closing a risk item defined.

E.9.2.4 Step 4: Identify Key Decision Points

Risks reside in any technology development program. Risk management is an essential tool used by program managers to assess the adequacy of the integrated program plan in achieving program goals. At each program review, the decision to proceed with a program shall be based on recognition of identifiable risks and adequacy of contingency plans. It is recommended that risks be identified and assessed and mitigation options identified before each review.

E.9.2.5 Step 5: Define Risk Documentation Procedure

It is recommended that all risks identified, assessed, and mitigated be included in a program's documentation. The risk management planning section includes a risk identification worksheet and instruction for submitting risks. It also provides means of documenting steps taken in the risk management process for each risk until closure of the risk.

E.9.2.6 Step 6: Define Monitoring Procedure

When a risk is identified, immediate action may be taken to reduce or eliminate the risk. This would result in a change to the SEMP and possible closure of the risk. Alternatively, action may

be deferred until a specific predetermined trigger event occurs. It is recommended that the procedure and forms for identifying the trigger events and resulting contingency action be documented. It is also recommended that the forum for reviewing risks and status of trigger events be identified.

E.9.2.7 Step 7: Update This Section as Needed or With Any Updates of the Integrated Program Plan

It is recommended that the program progress be periodically reviewed against the Risk Management Planning section.

E.9.3 Risk Management Planning Outputs

The following is the general outline (Table E-8) to be used for the Risk Management Planning section (or as a separate plan if considered necessary).

Table E-8. Table of Contents Risk Management Planning Section of the SEMP

Risk Management Planning Section Outline	
1	SCOPE
1.1	Overview
1.2	System Overview
2	RISK REVIEW TEAM
3	RISK MANAGEMENT PROCESS
3.1	Process
3.2	Risk Assessment Criteria and Mitigation Requirements
3.3	Key Decision Points
3.4	Documentation Requirements
4	RISK MONITORING PROCEDURE
5	RISK MANAGEMENT SCHEDULE
6	NOTES AND REFERENCES
7	APPENDICES
7.1	Documentation Forms
7.2	Risk Management Tools

E.9.4 Risk Management Planning Metrics

Completion (or revision as needed) of the Risk Management planning section before each AMS phase exit review and approval of this section at the review are the primary metrics of success.

E.9.5 Risk Management Planning Tools

Risk Management Planning is typically prepared using a word processing tool. Refer to the appropriate sections of this manual to ensure that the activities described in the Risk Management Planning section are consistent with the SE planning process. This comparison ensures that risk management is injected into the progressive and iterative SE process steps for this program.

E.10 Configuration Management Planning

Configuration Management planning documents the formal management system of CM to ensure that the integrity and continuity of the design, engineering, and cost tradeoff decisions made between technical performance, producibility, operability, testability, and supportability are recorded, communicated, and controlled by program and functional managers. CM planning provides the means for the following processes:

- Configuration Identification process that identifies the functional and physical characteristics of selected system components, designated as configuration items (CI), during the system's acquisition lifecycle
- Configuration Control process that controls the changes to CIs during the system's acquisition lifecycle
- Configuration Status Accounting process that records/reports change processing and implementation status
- Configuration Audits process that supplies current descriptions of developing hardware configuration items, computer software configuration items , and the system itself

The Configuration Management Organization typically owns this planning section. The planning section may be initiated by inputs from the SE process as early as the Investment Analysis, phase one, but formally starts at Investment Analysis, phase two, and continues throughout the program lifecycle as the system develops and is modified.

E.10.1 Inputs to Configuration Management Planning

Following are the two categories of CM planning:

Concepts (initial, baseline). This data identifies the functional and physical characteristics of selected system components and CIs to be controlled and managed.

Integrated Program Plan Requirements. This data identifies contractual and noncontractual constraints, such as program deliverables, cost, and schedule.

E.10.2 Configuration Management Planning Steps

Establish and maintain a plan to accomplish the objectives of the process. CM planning and management are essential in providing for an effective CM program throughout all lifecycle phases. Formally document planning and management activities and ensure continuity of CM practices at all levels of management. If acquiring a system or product, require that the developing organization or contractor has adequate CM in place. Review contractor CM plans, quality assurance plans, processes, and CM and CM-related contract deliverables.

Provide resources that are adequate for performing the process as planned. Ensure that CM resources—including people, funding, tools, and facilities—are sufficiently available throughout the program/project lifecycle to support CM program goals and objectives.

CM shall provide the CM section of statements of work and associated contract deliverable requirements lists. This section ensures that appropriate CM activities and CM-related deliverables are included before contract award. This is a critical activity in CM planning, as it ensures that the FAA is able to track and manage the costs, schedules, and requirements for program development, logistics, deployment, and transition before contract approval.

The CM section of the IPP Planning determines the resources for CM activities throughout the lifecycle; establishes the mechanisms to perform the CM process; designates the responsibilities of the organizations performing the CM process; and ensures that control will be extended to vendors and contractors during equipment acquisition.

Refer to FAA Order 1800.66, paragraph 3.2.2.1, for guidance on specific requirements for CM planning. CM planning documents may include, but are not limited to:

- CM procedures specific to the BU, IPT, or solution provider
- CM organization and responsibilities
- Lifecycle CM process description
- High-level configuration description
- Transition process description for each program

Audit plan for each program

E.10.2.1 Step 1: Collect Input Data

First, collect all input data.

E.10.2.2 Step 2: Define Configuration Items

The planner determines what is to be controlled and managed by identifying the CIs from the initial and/or baseline concept.

E.10.2.3 Step 3: Identify Means for Configuration Change Management

The planner needs to determine how to control and manage each of the identified CIs.

E.10.2.4 Step 4: Identify Means for Configuration Status Accounting

Determine when and how to document the change processing and implementation status and establish the frequency and format of the record and report documents.

E.10.2.5 Step 5: Identify Means for Configuration Verification and Audit

Identify methods to supply current descriptions of the CIs and means to trace all changes back to the baseline configuration.

E.10.3. Outputs of Configuration Management Planning

The output shall be the Configuration Management Planning section that outlines all the tasks with corresponding completion dates and personnel responsible for task completion.

E.10.4 Configuration Management Planning Metrics

The metric for measuring the product of the CM Planning process is completion of the planning section within cost and schedule.

E.10.5 Configuration Management Planning Tools

The CM Planning section is typically prepared using word-processing and drawing tools.

E.11 Verification Planning

E.11.1 Master Verification Plan

The Master Verification Plan (MVP) describes the overall verification program. It provides the content and depth of detail for full visibility of all verification activities. Each major verification activity is defined and described in detail. The plan provides a general schedule and sequence of events for major verification activities. It also describes test software (including code and documentation), Ground Support Equipment , and facilities to support verification activities. The systems engineer and verification engineer develop the plan with design and test organizations, with all having a thorough understanding of the verification program concept, program requirements at all levels, and the methods identified in the Verification Requirements Traceability Matrix (VRTM) for verification.

E.11.2 Verification Requirements Traceability Matrix

The VRTM is that portion of a requirements document that defines how each requirement is to be verified, the plan that describes the verification activity, and the results (including traceability to the test of verification report). The VRTM is based on the Validation Table documented in the Validation Report. The design, test, SE, and verification team members jointly develop the VRTM. The VRTM establishes the basis for the verification program.

E.11.3 Requirements Verification Compliance Document

The Requirements Verification Compliance Document (RVCD) provides the evidence of compliance for each requirement at all levels and to each VRTM requirement. The flow down from the requirements documents to the VRTM completes the full requirements traceability. Compliance with all requirements ensures that the system-level requirements have been met.

The RVCD defines for each requirement the methods of verification and corresponding compliance information. The results of the verification activity, including evidence of completion, are recorded and documented in the RVCD. It is recommended that the RVCD contain information regarding the results of each verification activity and a description and disposition of conformance, nonconformance, conclusions, and recommendations. The compliance information provides either the actual data, or a reference to the location of the actual data, that shows compliance with the requirement. The document also includes a section that details any noncompliances; it is recommended that this section also specify appropriate re-verification procedures. The RVCD is an input into the Requirements Management process (Section 4.3). Decisions regarding what to do with noncompliant requirements are made in Requirements Management.

E.11.4 Master Verification Plan Metrics

Three fundamental metrics exist to help measure and improve the verification plan:

- Timeliness of developing and reviewing the verification plan
- Quality of developing the verification plan

- Cycle Time to complete development and distribution of the verification plan regarding collecting and reviewing the inputs for verification plan development

E.11.5 Master Verification Plan Tools

The MVP shall be completed in accordance with the guidelines documented and tools described in this section and Validation and Verification (Section 4.12).

E.12 Integrated Lifecycle Plan

The Integrated Lifecycle Plan (ILP) ensures that resources are available for all activities required for integrate lifecycle support to be accomplished. Integrated Lifecycle planning includes integrated logistics support, deployment and transition, real property management, sustainment and technology evolution, and disposal. The planning steps for all elements are the same and are listed below. The only differences are the inputs, which are found in Section 4.13, Lifecycle Engineering. See Table 4.2-4 in Section 4.2, Integrated Technical Planning, for the outline of the integrated lifecycle plan.

E.12.1 Integrated Logistics Support Planning

Integrated logistic support defines the life support concepts and requirements and determines the associated cost and schedule. All activities to perform these tasks will be included in the integrated logistics support planning section of the ILP. Integrated logistic support planning includes the following nine elements.

E.12.1.1 Maintenance Planning

This section includes all resources for developing the maintenance plan, including development of the maintenance concept, which separates components into line replaceable units (LRU) and depot maintenance required units.

E.12.1.2 Maintenance Support Facility

This section includes all resources for determining the capability of facilities to support an additional system, which includes space for the system test equipment and LRUs storage, as well as for determining repair facility requirements and costs.

E.12.1.3 Direct-Work Maintenance Staffing

This section includes all resources for determining the composition of the current workforce, evaluating the need for additional personnel, and identifying the number, level, and type of personnel needed.

E.12.1.4 Supply Support

This section includes all resources to obtain a list of spares for site and depot, input and run the spares planning model, and evaluate design constraints and appropriate trade studies. It also includes the efforts to procure the proper range and quantity of spares for all facilities.

E.12.1.5 Support Equipment

This section includes all resources to develop a list of existing support and test equipment and obtain costs of new or modified equipment and recommended quantities. It also includes the

resources for a system analysis to determine support and test equipment, common and special tools for installation, repair, adjustment, test, and maintenance.

E.12.1.6 Training, Training Support, and Personnel Skills

This section includes all resources to manage, develop, and conduct systems training. It also includes resources to determine what training is needed, the level of training, and when training should take place to support installation and commissioning.

E.12.1.7 Technical Data

This section includes all resources to identify users' requirements for technical data and to ensure that they are included in the contract.

E.12.1.8 Packaging, Handling, Storage, and Transportation

This section includes all resources to identify associated requirements and to determine if there are any special storage or transportation needs.

E.12.1.9 Computer Resources Support

This section includes all resources to determine computer resources to support the lifecycle, evaluate overlap with other computer needs, and provide minimum lifecycle needs.

E.12.2 Deployment and Transition Planning

This section of the ICP includes all resources to determine computer resources to develop a cutover plan and prepare all sites (especially key sites) for a new install and checkout system at each site; as well as to conduct field familiarization testing for key sites, conduct dual operations at key sites, and prepare for In-Service decision. This section also includes resources to perform integration and test, to commission each site and dispose of replaced assets, and to prepare an independent operational test readiness declaration and conduct an independent operational test and evaluation.

E.12.3 Real Property Management Planning

This section includes all resources to evaluate the need for real property and a procurement method; perform market survey and evaluate offers; award contract and evaluate need for improvement or alterations; and manage the property.

E.12.4 Sustainment/Technology Evolution

This section includes all resources to track and evaluate RMA performance and supportability issues; analyze supportability issues caused by market-driven obsolescence; and determine the most cost-effective means of avoiding projected supportability shortfalls. It also includes resources to assess integration of obsolescence-driven system changes with new requirements; evaluate the impact of engineering changes, performance shortfalls, or technological opportunities on integrated logistics support products and support services; and support revalidation or development of mission need statements.

E.12.5 Disposal

This section shall include all activities associated with disposal management, dismantling/demolition/removal, restoration, degaussing, or destruction of storage media and salvaging of decommissioned equipment, systems, or sites. The systems, components,

assemblies, and so forth that will be removed, disposed, or cannibalized must be identified, as well as the disposal responsible agent. In the planning, include an assessment of the system to determine the need to scavenge usable parts/subsystems from facilities to be decommissioned; an evaluation of environmental issues (including any hazardous materials); a determination of disposition location; and deletion of the system from the operational inventory.

E.12.6 Integrated Lifecycle Planning Steps

E.12.6.1 Step 1: Collect Inputs

Coordinate with technical groups on analysis needed and collect inputs. Some inputs include:

- Component-specific program guidelines
- Program-specific organizational constraints and assumptions to be used in the program
- Program-specific schedule constraints and events
- Top-level conceptual alternatives, functional analyses, design support alternatives, and initial system evaluations
- Technology availability or constraints
- Operational concepts

E.12.6.2 Step 2: Analyze Inputs

Review and organize the data; check for conflicts in precursor/successor relationships among different analyses; and prepare management summaries of resource needs (cost, equipment, facilities, and talent).

E.12.6.3 Step 3: Coordinate With Interfacing Program Functions

Determine details of lifecycle integrated logistics skill and tool inventories, data sets, and scheduling so that specific and correct references may be made in the planning section.

E.12.6.4 Step 4: Lay Out and Baseline the Planning Section

Coordinate the draft planning section; support management/analyst/user negotiations; incorporate revisions; obtain necessary approvals; and release the baseline version of the planning section in the ILP. Although no standard format exists for developing the section, it is recommended that it contain the key elements of tasks, deliverables, responsibilities, and schedule. Developing a standard format may be included in this step.

E.12.7 Outputs of Logistics Management Planning

The output of this process is the Logistics Management Planning section of the ILP.

E.12.7.1 Logistics Management Planning Tools

A word-processing tool is needed.

E.13 Maintain System Engineering

All resources required to maintain SE are included in the SEMP. The associated activities include monitoring the SE processes and implementing improvements as necessary.